GROW FORCE

Flowfeed

TOTALLY SOLUBLE NUTRIENT

FERTIGATION WITH FLOWFEED

Developed by Grow Force for Australian conditions, Flowfeeds are a range of totally soluble blended nutrients capable of being metered into irrigation systems. They are ideal for use in any crop where trickle irrigation or sprinklers are used, and wherever nutrients can be injected into the irrigation water.

RECOGNISED ADVANTAGES OF FERTIGATION WITH FLOWFEED.

Fertilising through the irrigation water, or fertigation, is recognised as a very effective and convenient method of maintaining optimal nutrient and moisture levels. Fertigation with Flowfeed offers a number of advantages:

- Improved efficiency - the trickle and mini sprinkler fertigation systems waste much less fertiliser as well as water, because only the crop root zones are watered and fertilised.
- Potential to accurately time nutrient application to match crop demand. Labour and energy savings - no need for manual side dressings.
- Allows for double or triple cropping - because Flowfeed can provide most nutritional elements.

All Flowfeed products are made from the highest quality technical grade ingredients available. They feature the following qualities:

- High solubility and stability in solution.
- Soluble phosphorus content.
- Selected trace elements in chelated form.
- Balanced levels of major nutrients and trace elements.
- Negligable chlorides in the products.
- Specifically formulated to suit Australian conditions.

CHELATED TRACE ELEMENTS: Chelates are organic complexes in which the trace element is tightly held but remains available in a form that the plant can absorb and utilise.
Although soluble, most chelates are absorbed on to the clay particles in the soil and are not easily leached away from the plant root zone. Chelated trace elements are also very compatible with most nutrients.

SOIL APPLICATION

Flowfeeds aim to supply nutrients in the irrigation water directly to the root zone of the crop. For annual crops, Flowfeeds can replace solid fertiliser sidedressings, and often allow a reduction in preplant and basal fertiliser rates. In perennial crops Flowfeeds can largely replace solid fertiliser applications.
Fertigation should occur in small regular doses according to plant growth stage. When fertigating, it is very important to irrigate with water alone before and after injecting Flowfeed into the irrigation system. This will avoid root burning and the build up of micro organisms in the irrigation lines.

Product Choice and Application Rates

The choice of Flowfeed and rate of application will depend on factors such as the crop grown, fertilising history, growth stage, and growing environment. Both a crop's demand for nutrients and the ratio in which they are required will vary during the growing period. Monitoring of soil and leaf nutrient levels with soil, leaf and sap analysis is also important in determining the most efficient use of Flowfeeds.

Application Frequency

Frequent applications of low nutrient concentrations of Flowfeed, rather than less frequent applications at high concentrations, is the more desirable practice. Ideally it is best to fertigate during each irrigation for both fruit and vegetables. Generally, for vegetables, fertigation at least weekly with Flowfeed is the minimum recommendation. This period extends to 2 weeks for fruit trees.

Frequency of application will also depend on soil type. Being water soluble, Flowfeed has the chance of being leached more readily from sandy soils than from heavier clay soils.

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Therefore application of Flowfeeds to sandy soils should be at lower rates and more frequent.

Injection Methods and Rates

The simplest method of Flowfeed injection is by using a dilutor or pressure differential tank. The most accurate and easily automated method involves making a stock solution by dissolving 250g of Flowfeed in 1 litre of water (25kg per 100 litres). This stock solution can then be injected under pressure or by venturi directly into the irrigation line.

Final concentrations of up to 0.5% (5g/L) have been found to be safe in most crops, but usually much lower concentrations are used.

If a specific nutrient concentration is required for fertigation, then the rate of injection needs to be calculated:

The correct rate of injection depends upon -

* The desired strength of solution to be delivered to the crop.
* The strength of the stock solution in the injector tank.
* The flow rate of the irrigation pump.

Use the following simple formula to calibrate your system:

$$I = \frac{FC \times P}{SC}$$

I = injector output (litres/min)
FC = desired concentration of the "Fertigation Water" g/L
P = pump output (Litres/min)
SC = concentration of the stock solution g/L

FOR EXAMPLE:

* You want to deliver Flowfeed to your crop at 1.0 g/L
* Your pump output is 500L/min
* The stock solution is at 250g/L

Then the injector output (I) should be:

$$I = \frac{1.0 \times 500}{250} = 2 \text{ L/min}$$

FOLIAR APPLICATION

Flowfeeds are ideally suited for foliar application because of their high solubility, low salt index, and ease with which they can be absorbed into plant foilage.

CAUTION: Check label for any biuret warning.

Rates:
Flowfeeds can generally be applied at 2-4 kg/ha, in a spray a concentration of 0.5% to 1.0% i.e. 0.5kg to 1.0kg per 100 litres of water.

Use the lower concentration on sensitive crops and seedlings. If crop sensitivity is unknown, apply to a small test area and observe for any adverse effects before spraying the total crop. In any case, foliar applications using Flowfeed should only be made to crops where it is known that the recommended rates will not cause leaf burn.

Frequency:
Repeat applications at 7-10 day intervals. The addition of a suitable non-ionic wetting agent will help ensure even spreading and adherence of Flowfeed to the plant foliage.

PRECAUTION: Do not apply in strong sunlight – late afternoon applications are recommended.

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ANALYSIS %(w/w)

	N	P	K	S	Fe	Mn	Zn	B*	Cu	Mo*
BA1	15.4	1.7	29.1	5.5	-	-	-	-	-	-
BM7	12.4	16.9	12.3	0.6	0.1	0.05	0.02	0.02	0.007	0.002
CO3	20.9	8.6	16.2	-	-	-	0.02	0.05	-	0.01
DM3	12.8	6.9	28.2	-	-	-	0.02	0.05	-	0.01
EX7	20.8	3.3	17.4	4.8	0.13	0.07	0.03	0.03	0.01	0.002
GF9	14.0	4.6	23.0	4.6	0.22	0.11	0.05	0.05	0.01	0.002
HP8	7.1	11.1	27.6	2.8	0.27	0.13	0.06	0.09	-	0.01
RX3	18.0	3.8	20.7	4.5	-	-	0.06	0.2	-	-
SJ6	13.7	1.6	29.4	3.3	0.22	0.11	0.05	0.05	0.01	0.002
TP3	28.1	4.4	11.1	2.2	0.13	-	-	-	-	-

* Boron (B) and Molybdenum (Mo) present as inorganics

FLOWFEED FORMULATIONS

There is an extensive range Flowfeed formulations. Alternatively, Grow Force can produce a special blend to suit a customer's specific requirements.

SOLUBILITY

Only high quality, technical grade, completely soluble ingredients are used in Flowfeeds. At room temperature (around 20°C) 250g of Flowfeed will dissolve in 1 litre of water

At temperatures below 20°C reduced solubility may be encountered. It is then advisable to mix less Flowfeed per litre of water. Alternatively, adding warm water to the stock solution tank can raise the solubility.

The following table is a guide to the solubility of Flowfeeds at different water temperatures:

Water Temperature	Flowfeed Solubility
10°C	150g/L
20°C	250g/L
30°C	350g/L

VOLUME CHANGE

Every 2kg of Flowfeed added to water will increase the volume of solution by approximately 1 litre.

COMPATIBILITY

All Flowfeed products listed in this bulletin are compatible with each other.
Additional chelated trace elements may be mixed in for the correction of known specific element deficiencies.

It is **not recommended** to mix Flowfeed with:

- Other brands of liquid or foliar fertilisers.
- Sulphur lime,Bordeaux mixture or other copper fungicides.
- Inorganic preparations, e.g. zinc sulphate, calcium nitrate, magnesium sulphate.
- Ordinary NPK fertilisers.
- Selective (hormone) weed killers.

Advice on compatibility with specific product mixtures should be sought from Grow Force before use.

CORROSION HAZARD

Flowfeeds, as with most fertilisers, will be corrosive to metals, mild steel, carbon steel, and mild steel reinforced concrete. However, provided the system is thoroughly flushed out with fertiliser free water at the end of each run, corrosion of metals should be kept to a minimum.

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